

## Recent Exploration for the Remains of Early Man in India

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### INTRODUCTION

This is a short account of the field work conducted by the writer during 1959-60 under a research scheme which was financed by the Council of Scientific and Industrial Research [CSIR] Government of India. Its object was to discover fossil man in India by making a thorough search of the caves, rock shelters, Pleistocene deposits and implementiferous cum fossiliferous sites known and unknown. The areas selected for this were in the Shiwalik foothills in the north, the Narmada valley in the middle and the Earamalai hills of Kurnool in the South—all were very well known for the wealth of fossils and stone age tools since a century or so (Map 1).

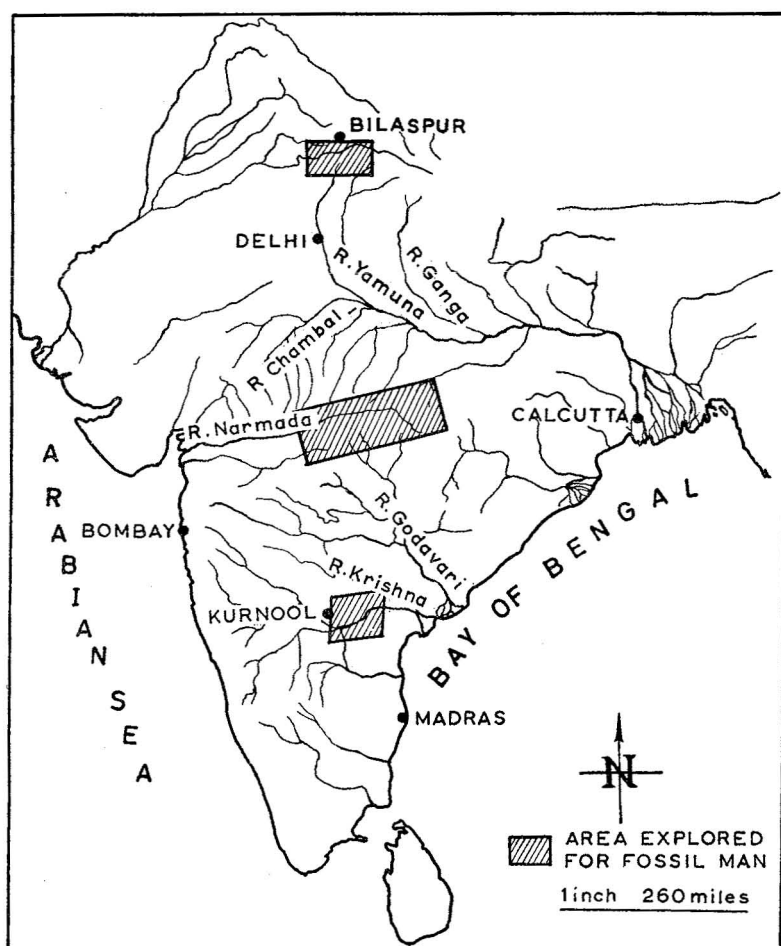
Though we did not find what we were searching for—fossil man's bones—the project had for effect to bring together for the first time in India, a geologist and a prehistorian archæologist. Dr D. N. Wadia, F.R.S., the Chairman of the Board of Geological Research of the CSIR, Dr M. R. Sahni, the President of Palæontological Society of India, and Dr H. D. Sankalia, the Director of the Deccan College Post-graduate and Research Institute, Poona, are to be congratulated for the scheme and obtaining its approval by the Council.

In our attempt, many important problems belonging to the domain of prehistoric archæology and Pleistocene stratigraphy were tackled, and very rich collections of fossils and implements were made. Their study will throw light on fossil man's culture and on the variety of mammalian fauna, contemporary with him. No homonid fossil remains were found.

### THE SHIWALIKS

To students of human origins, the Shiwaliks are known for their remains of fossil primates, which made them known world-wide as one of the most important evolutionary centres of sub-human primates. The primate collection so far made from these foothills include some four genera and ten species of anthropoid apes ranging stratigraphically from the Middle Miocene to the Early Pleistocene. Unfortunately the primate remains so far discovered are very fragmentary and no definite conclusion can be drawn on their probable lines of descent and their relationship to the main trunk of human ancestry. Yet they provide us with the proof that there existed a vigorous and highly differentiated family of the anthropoid apes in an epoch when man is believed to emerge from his 'animal state'; and they suggest that Early Man may have existed in India and his fossil remains may eventually be discovered in these foothills of the Himalayas.

In all eight localities are mentioned in the record, from where primate finds have been obtained in the Shiwaliks. These are Chinji in Attock district (Lower Shiwaliks)

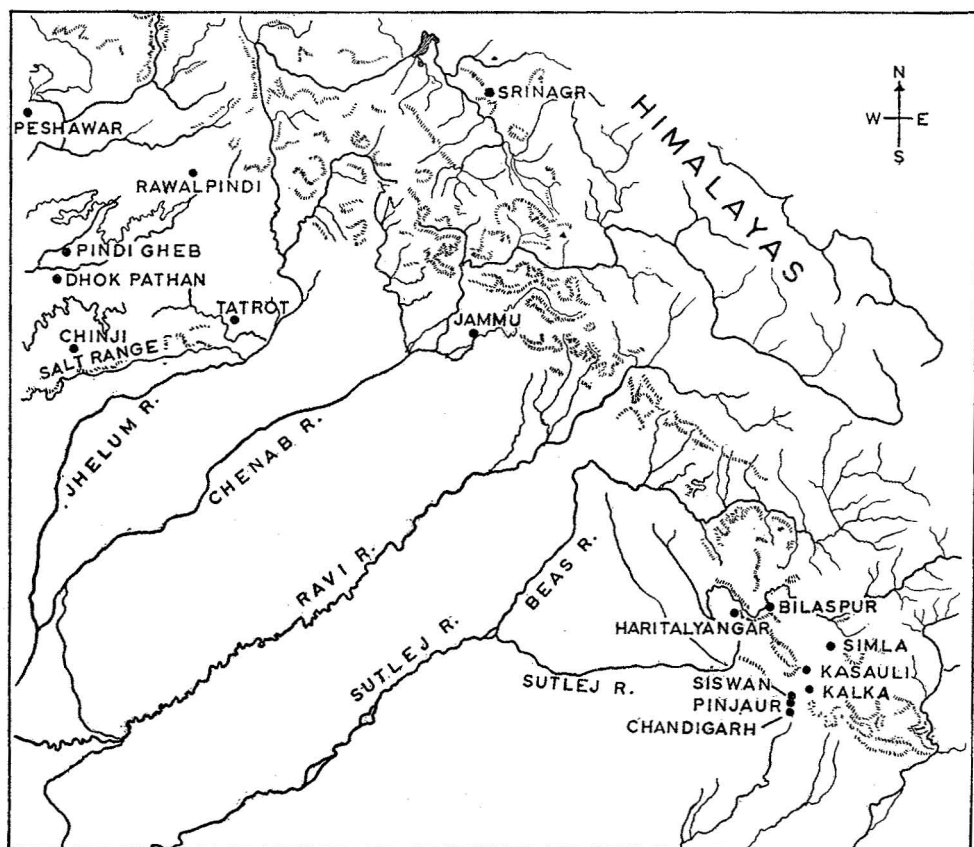


MAP 1. Map of the areas explored for fossil man by the author.

Alipur in the eastern part of the salt range (Middle Shiwaliks), Jabi in West Panjab (Middle Shiwaliks), Ramnagar in the Jammu district (Middle Shiwaliks), Hari Talyangar north-west of Bilaspur (Middle Shiwaliks) and Chakrana near Hari Talyangar. The first five localities went to Pakistan after the partition of the country while the last three are with India. Among these sites, Hari Talyangar has proved to be the richest and it was decided therefore to re-explore it under the present scheme (Map 2).

#### *Field Work in Bilaspur (Himachal Pradesh)*

Hari Talyangar is named after the twin villages of Hari and Talyangar, one situated at the bottom of the valley while the other is on the top of the hill near a scrap on which Hari temple is situated. This place is nineteen miles north-west of Bilaspur and about four miles from Dadhol, a bus halt, on Bilaspur-Ladrol road. On seeing the situation of Talyangar for the first time, one gets the impression that this area



MAP 2. Map of important fossiliferous localities in Punjab and Kashmir Shiwaliks. Hari Talyangar site was explored during the present exploration.

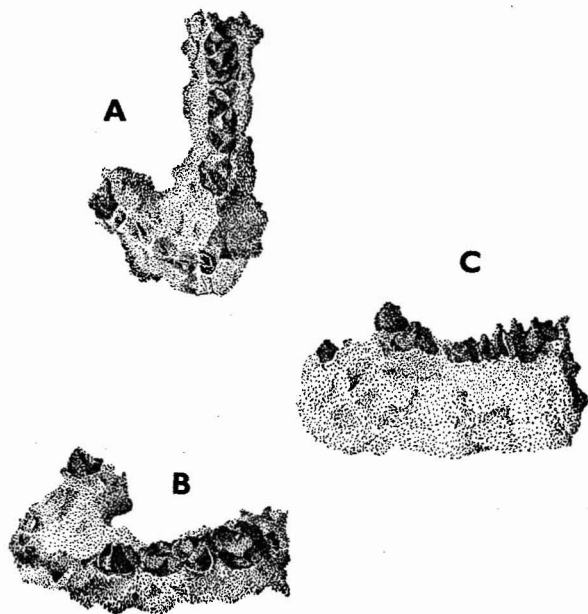
might have once been a mighty lake. The inhabitants of Talyangar are Brahmin peasants while those of Hari are Harijans by caste but all are landowners and are farmers by occupation.

The Hari temple scrap locally known as Hari Ka Tibba, is a treasure house of primate fossils. It is only 200 metres from Hari village and its pinkish-red sandy layers belonging to the Nagri Zone are fossiliferous. An almost complete mandible of a primate resembling the present-day loris, but a little larger in size, was obtained by the writer from the loose sandy deposit of this zone. Most of its teeth are intact except one canine and one molar. It is the most important find this locality yielded during the present field work.

This area was explored in the months of May-June-July of 1959. Luckily the writer found Bhoj Ram, the man who worked with previous collectors, American as well as Indian. He was very useful in locating the old strata and in finding new ones.

Besides Hari temple scrap the other spots explored around this area were: Danger Tibba which is found on the way before Talyangar is reached and high grounds below the village of Thana on the right side of the stream flowing behind the village

of Talyangar. These two localities yielded a few molars of *Hipparion* and some long bones of extinct animals.



Drawing of a newly discovered loris.

Incidentally this locality is also important for the solution of the problem of the stratigraphy of Shiwaliks, which is based on palæontological considerations. The remains of *Hipparion*, the three-toed horse, are found here in abundance and it is on the working out of its differences in relation to its North American counterpart and its time of migration to India and other parts of Eurasia, that we can place exactly the different Shiwalik Zones into a proper geological time scale.

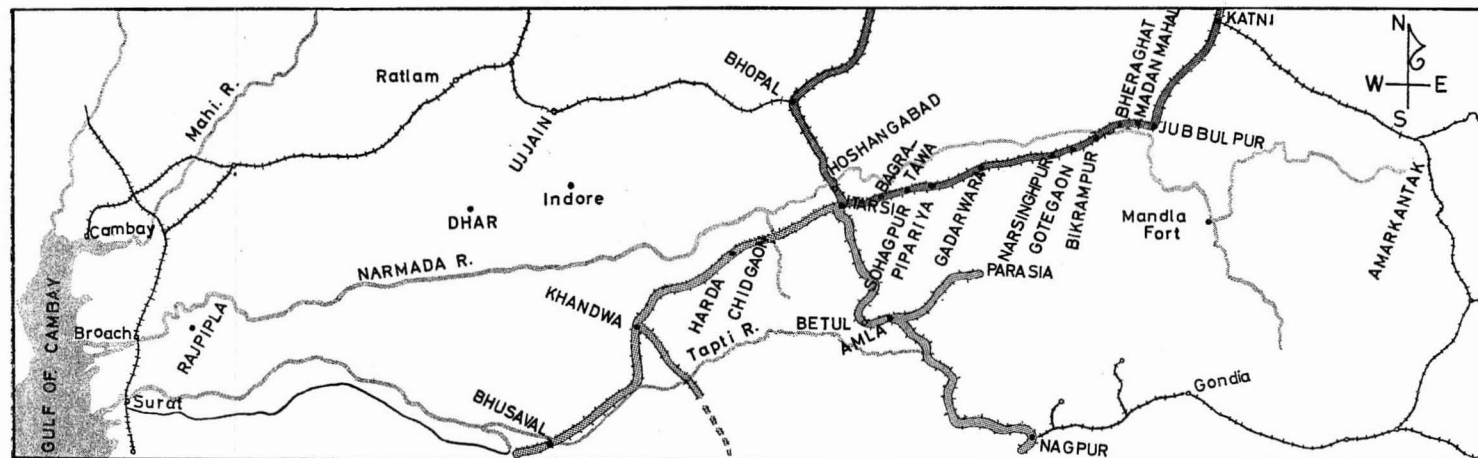
Chakrana, the second primate yielding locality of India is situated not far off from Hari Talyangar. It is on the main Ladrol road and only four miles from Dadhol. From Chakrana the Dhaul Khan scrap is visible with its ashy-colour sand stone. Here, very good sections are exposed.

Many khads and nalas were explored around Hari Talyangar and on the way to Bilaspur. Worthy to be mentioned are:

- |   |                                       |
|---|---------------------------------------|
| i. Barhari Nala near Ladhani—a tributary of Sirkhad;              | vi. Ali Khad;                         |
| ii. Ahurs—seven miles northwest of Bilaspur near Bhajwani bridge; | vii. Sarhali;                         |
| iii. Sirkhad near Langari village;                                | viii. Gambhar—12 miles from Bilaspur; |
| iv. Shukkar Khad;   | ix. Ghamrola—6 miles from Bilaspur.   |
| v. Rahul Khad;  |                                       |

Besides the mandible of a primate, the present fossil assemblage contains *Hipparion* (probably *H. antelopinum*), *Suidae*, *Proboscidea*, *Rhinocerotidea*, etc.







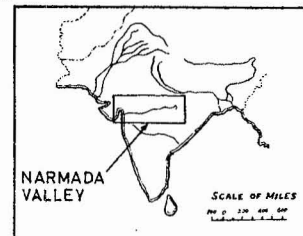


THE NARMADA VALLEY WITH MAJOR TOWNS  
AND IMPORTANT CENTRES OF COMMUNICATIONS  
IN AND AROUND IT.

SCALE:- 1 INCH=45 MILES

LEGEND:-

- BHUSAVAL DIV. 
- NAGPUR DIV. 
- JUBBULPORE DIV. 
- JHANSI DIV. 



MAP 3. Narmada valley with major town and important centres of communications in and around it.  
The area intensively explored was in between Hoshangabad and Jubbulpur.

### *Fossiliferous Localities in Hoshiarpur*

While returning to Chandigarh, I took a different route via Unna near Hoshiarpur. At Hari Talyangar, I was informed of a fossiliferous locality called Chini Ghati, about ten miles from Unna, in the midst of a thick forest. Moreover, I knew the reports of the discovery of the Sohanian sites near Hoshiarpur which tempted me to take such a circuitous route. I examined the following localities and made a preliminary survey to be followed by intensive investigations of the khads and nalas and innumerable sections exposed in these parts. The localities from where fossils were collected are:

- |                |            |                  |                 |
|----------------|------------|------------------|-----------------|
| i. Chini Ghati | ii. Maili  | iii. Kotla Daman | iv. Pandogha    |
| v. Bankhandi   | vi. Ecepur | vii. Ram Talwali | viii. Sidhanwal |

Among all of these, Bankhandi and Chini Ghati are the richest.

### THE NARMADA VALLEY

The whole of the Narmada (Map 3) is rich in Stone Age tools, but it is only the upper portion of the valley from Narsinghpur to Hoshangabad which yields implements together with fossils embedded in old deposits. Besides this advantage we also find beautiful sections and cuttings which when studied help us to reconstruct the past climates and the history of the river. Only such an area is expected to reward us with fossil man and the records, as a matter of fact, show that Theobald actually found a skull which he believed to be of fossil man in a conglomerate bed. That previous find was however lost unstudied in the treasure house of the Asiatic Society of Bengal, like the Magdalenian points of Foote from the Bilasurgam cave at Kurnool.

### *Previous Research*

Fossils began to be collected from the Narmada in the early thirties of the last century. Spilsbury (1833-41) collected several bovine skulls from the older alluvium of the Narmada which Princep described and figured in 1834 (Pilgrim). The first one to work on the Quaternary deposits (then called Tertiary) of the valley was Theobald who published his results in a classic paper in 1860 in the 2nd volume of the *Memoires* of the Geological Survey of India. The credit of discovering the first convincable man-made 'celt' goes to Mr Hacket. The 'celt', in fact a beautiful hand-axe made quartzite, was described by Mr. H. B. Medlicott in 1873, in an article where he attacked Falconer for perpetuating the wrong conceptions on the age of ossiferous deposits of the Narmada. Falconer believed these deposits to belong to the Pliocene while Medlicott thought they were Upper Pleistocene.

Pilgrim (1905) described some fossils but there is no separate work on the Narmada as yet dealing with the fossil fauna, as in the case with Shiwaliks, probably due to the paucity of the material from that region.

The credit for making the first correlated studies in the prehistoric Pleistocene goes to the Yale-Cambridge Expedition. De Terra and Teilhard de Chardin (1939) during a brief sojourn of two weeks in 1935 brought again to our attention this region and pointed out 'its intermediate position between the glaciated highland

and the tropical belt between the mobile Himalayas and the Indian landmass'; they expressed the hope that one day solutions would be sought in the region for climatological and tectonic problems of the first importance. During their short field work they studied a few sections in Hoshangabad and Narsinghpur in the areas known previously for sections and fossils due to Theobald's work. Their stratigraphical observations were different in many respects from Theobald while their treatment of the Stone Age material was pioneering and bold. After this no work of appreciable significance was carried out in the region though Zeuner, in 1949 during his hurried trip around Indian prehistoric sites, paid a short visit to the lower Narmada system in Gujarat and made a few observations. Sankalia since 1952 has been engaged in carrying out Stone Age researches around Maheshwar area. An expedition, of which the writer was a member, was led here by Prof. T. D. McCown in 1958.

De Terra's opinions and theories remained unchallenged and his work assumed the form of a classic among the few papers written on the subject in India until the Council of Scientific and Industrial Research began to work in the area. The last two years have shown that in the area some of De Terra's conclusions on its stratigraphy and prehistory were incorrect. This was inevitable because of the short time he spent in the valley.

### *Present Field Work*

Field work in the Narmada valley was done for about six months, in two field seasons in 1958-59 and 1959-60. The area intensively investigated, lies between Hasalpur, a village five miles downstream from Hoshangabad and Mahadeo Piparia in Narsinghpur district, though other spots on the Narmada like Maheshwar, Mandleshwar, Harda, Bherghat and Amarkantak were also surveyed and the old alluvial deposits studied. The course of the Narmada from Hoshangabad to Mahadeo Piparia is over 150 miles long, along which, more than seventy prehistoric and palaeontological sites were located, some with beautiful cuttings and extensive old gravel deposits. Besides the main valley, tributaries like the Tawa, the Shukkar, the Sher, the Umar and the Barurewa were also examined over considerable length and the data collected helped to give us a general picture of the whole area lying between Satpura and Vindhya mountains.

A rich collection of the fossils and Stone Age tools was made during these explorations; about one thousand tools and well over two hundred vertebrate fossils which include three complete *Elephas* skulls obtained from Bhatgaon and Ajhera gravels in Sohagpur tehsil of Hoshangabad district. A large number of tools and fossils were found *in situ*.

A site with conglomerate deposits containing tools, depicting the apparent evolution of a hand-axe industry from the pebble stage to Early Abbrevillian hand-axes was discovered. The industry, which seems to be the most primitive discovered so far in India, has been named the 'Mahadevian Industry' after its type site (see 'Mahadevian: The Oldowan Pebble Culture of India', *AP*, 6: 16-17).

The Pachmarchi hills were also explored for rock shelters and caves. The old rock shelters at Adamgarh and around Pachmarhi were again visited and a rich collection of microliths was made for a detailed study of their typology.

### Conclusions

Some of the main results arrived at during these investigations were:

i. *Laterite*. The problem of its origin and the time of its formation is important for it affects the prehistory of Orissa and Madras. De Terra opined, depending on Oldham, that it underlies the boulder conglomerate containing Middle Pleistocene fossils and that it may be of the lower Pleistocene. During the present investigation I have not come across any evidences confirming stratigraphical position of the laterite below Mid-Pleistocene conglomerate. On the other hand, at Chidgaon, a locality 40 miles from Hoshangabad on Hoshangabad-Harda railway line, a nala was discovered in which sections are beautifully exposed with the deposits overlain by the laterite. In Satpura and Vindhachal ranges the writer came across localities where laterite is still being formed. Similar observations were made in Nalamalai hills in Kurnool district on the way to Giddalur from Nandyal.

The dating of the laterite in the Narmada valley remains to be solved. Research should be done on how laterite is still being formed so as to understand the conditions of its formation in the past.

ii. *Stratigraphy*. In investigating the stratigraphy of the Narmada banks, it was found that the lowermost stratum is of the red greasy clay against which rests the cemented boulder conglomerate exposed at Hasalpur, Hoshangabad and Mahadeo Piparia. This gravel is fossiliferous as well as implementiferous and may very well belong to the early part of the Middle Pleistocene. The red clay can be seen at Mahadeo Piparia and Pithera on the Narmada, Tindni on the river Umar and at Gadarwara on the Shukkar. There is an unconformity after the red clay, on which rests another layer of hard cemented gravel about 8 to 10 feet thick. The cemented gravel is overlain in turn by the sandy deposits 20 to 30 ft. laid under a sluggish current. Both these strata are again fossiliferous and implementiferous. Sometimes these sandy deposits merge with the yellow clay formed upon it and this yellow clay is capped by the black cotton soil. This sandy deposition sometimes shows bends and curves suggesting that they have been affected by earth movements. This phenomenon was noted at Tindni and at Gadarwara.

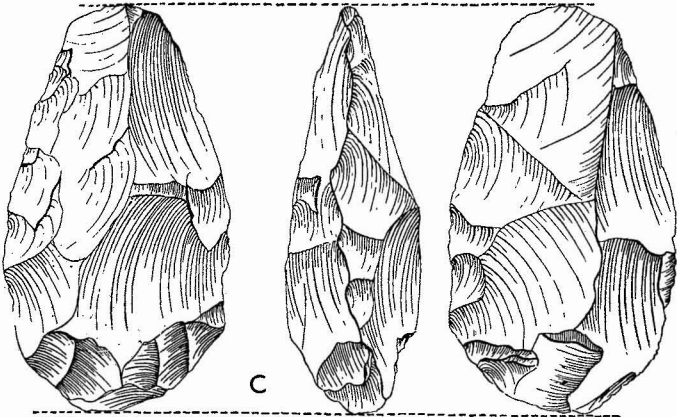
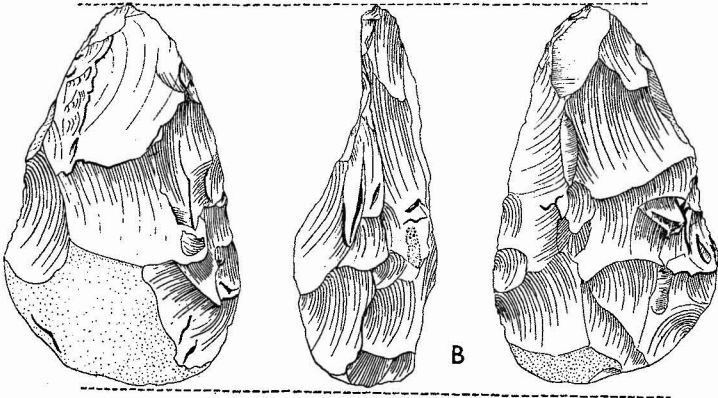
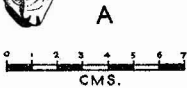
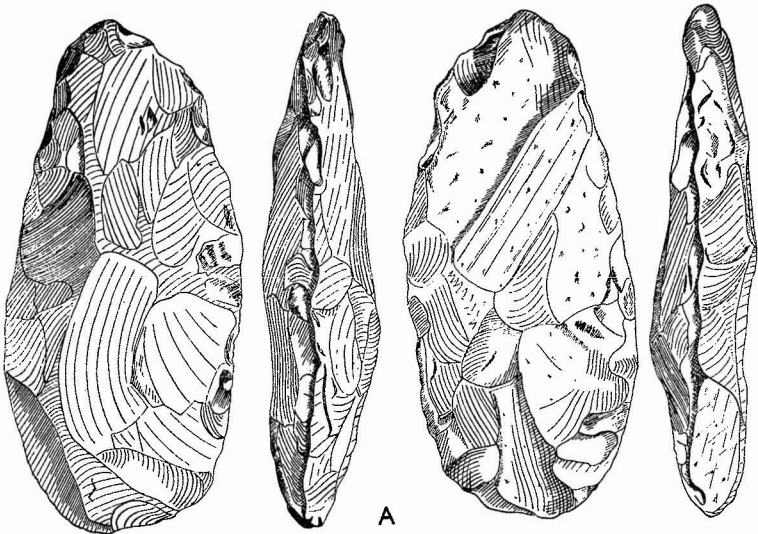
The above observations differ from De Terra in the following respects:

- a. They refute the triple cycle of deposition in the Narmada valley. Only two cycles were observed and the first cycle starts with Red Clay and not with the boulder conglomerate.
- b. No black cotton soil gravel was observed as such.
- c. The position of the boulder conglomerate was observed to rest against the red clay and not lying beneath it. The concretionary clay, which forms the banks of the Narmada at Hoshangabad, is not the lower clay, as may confuse people at the first sight, but the second clay with a little more red hue and concretionary content.

Our investigations here have succeeded in 'fixing' of the Stone Age industries in the stratigraphy of the Narmada.

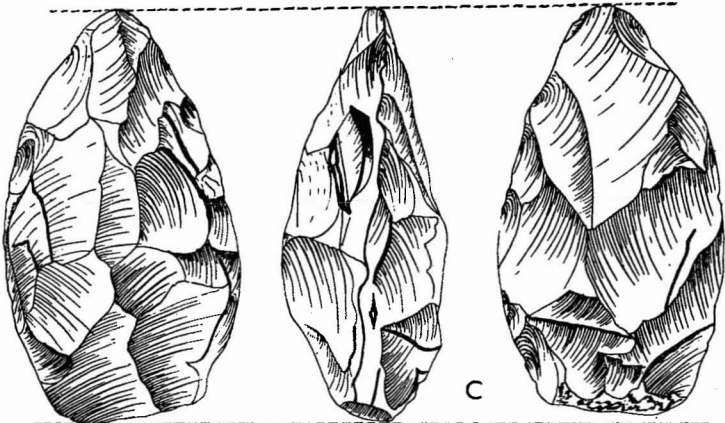
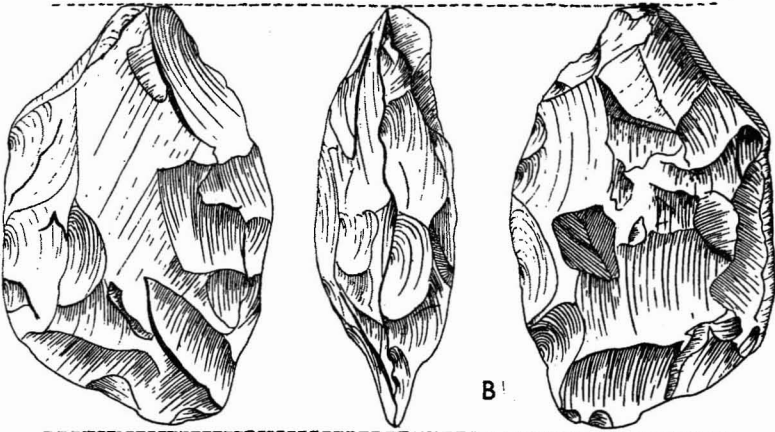
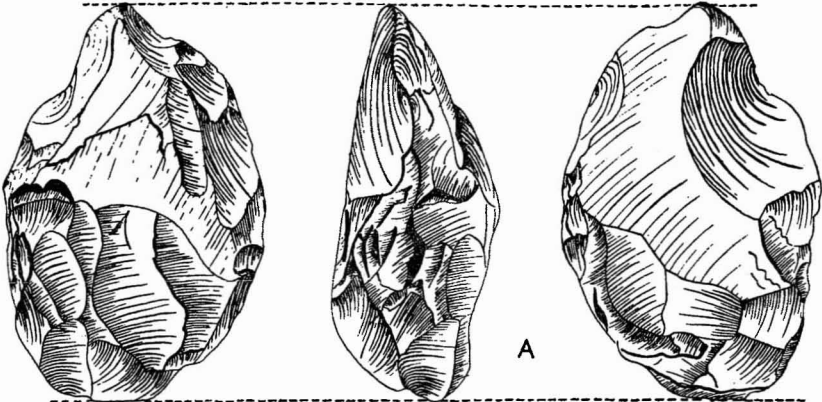
## FIG. 1. NARMADA HAND-AXES

- a. A beautiful oval shape, Acheulian biface with round butt and flat, tongue-like apex. The working edge wavy and alround. Both the surfaces upper and lower are chipped all over by shallow flaking material: fine grained red quartzite. Semi-rolled. Found at Budhni gravels, Hoshangabad. Measurements:  $196 \times 90 \times 41$  mm.
- b. A pear-shaped biface made on fine-grained quartzite. Butt-end broad and round. Apex rounded and elongated. The working-edge limited to the lateral sides. The right lateral edge has a slight 's' twist. The upper face with a cortex on the lower half of the tool and on the hump situated in the middle of the artifact. From the hump towards the tip, the tool has been flaked deeply resulting in much thinning of that portion. The underside has a shallow flaking almost allover except a small patch on the left of the butt-end. There is a small hump below the centre, with converged flaking alround. Partially rolled. Loc.: Bhagwara gravels, Hoshangabad. Measurements:  $141 \times 89 \times 59$  mm.
- c. A pear-shaped biface on coarse grained quartzite of greyish brown colour and was chiselled out *in situ* from the cemented sandy gravel (gr. II) at Bhagwara side of the Narmada, opposite Hoshangabad. Butt is broad and round; apex tongue-like and the working edge wavy and alround. The upper face worked all over with controlled flaking and with a meandering ridge running from the butt end to the tip. The underface also flaked all over. Partially rolled. Measurements:  $153 \times 85 \times 51$  mm.



## FIG. 2. NARMADA HAND-AXES

- a. A thick pointed ovate specimen, on fine-grained red quartzite with a small inside-curve on the left side just below the tip. The working edge blunt and alround. The upper face has a hump above the centre and is flaked all over. Many 'steps' present especially along the left side. The under face has a deep scar on the right side below the short and thick tip. Partially rolled. Loc.: Recovered from the Budhni gravels, Hoshangabad. Measurements:  $126 \times 84 \times 51$  mm.
- b. A double-pointed specimen made on greyish brown, medium-grained, quartzite. Recovered from Budhni gravels. Hoshangabad. The working edge alround except on the upper part of the right lateral where there is a platform-like surface. The upper face is worked all over. 'Thinning' has been attempted along the periphery. Many deep 'steps' present. The under face worked all over but during the rolling process the flake scars have been rubbed too much. Here also deep 'steps' occur. Measurements:  $131 \times 85 \times 42$  mm.
- c. A semi-rolled, pear-shaped biface, on a fine-grained red quartzite. The butt-end is straight and narrow with unprepared, elliptical platform at the base. The tip is short and pointed and the working edge wavy, alround, except at the butt-end. The upper face has a hump in the centre and many 'steps' occur along both the sides. The under face has broad, shallow flaking with a small slightly pointed hump a little above the middle. A big oblique 'step' above the butt. Loc.: Budhni gravels, Hoshangabad. Measurements:  $125 \times 71 \times 46$  mm.





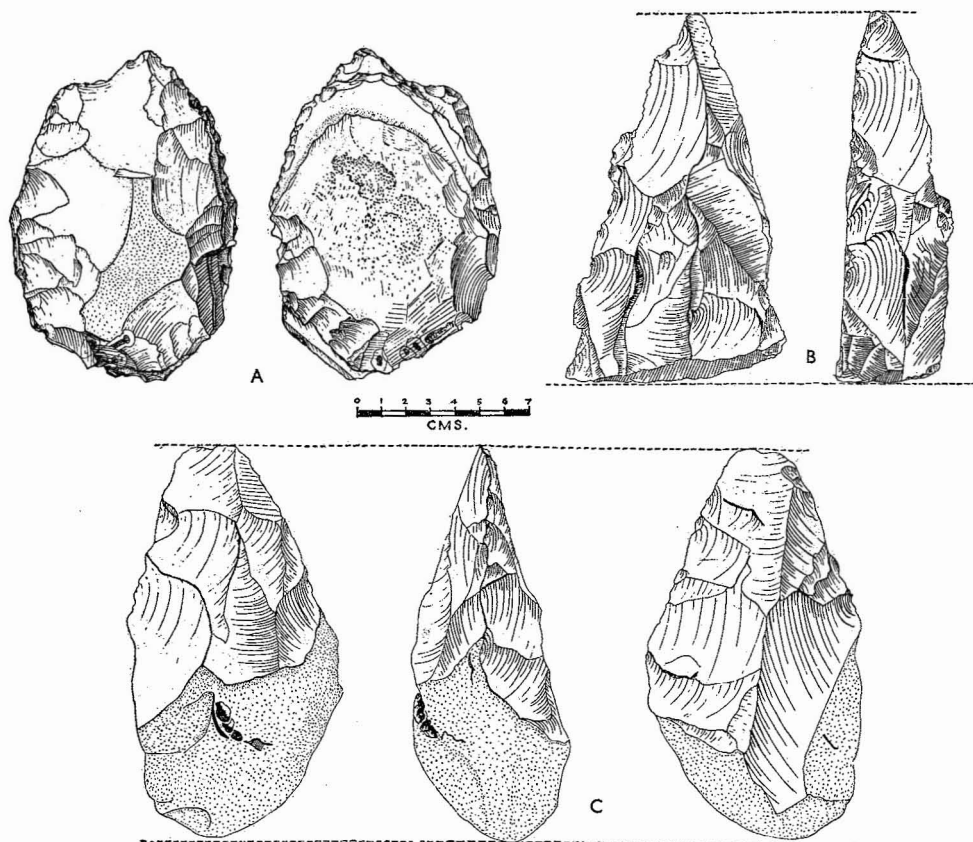


FIG. 3. NARMADA ARTIFACTS

- a. Of unrolled, choradate shape, advanced Acheulian hand-axe made on chert in which can be distinguished three horizontal joints or plates sticking one over the other. The upper face of the specimen is covered with original cortex while the under face shows shallow flaking mostly along the periphery leaving in the centre a patch of original cortex. The working-edge is around, sharp and irregular. Loc.: Found *in situ* in the upper sands, River Sher, Devakachhar. Measurements:
- b. A fresh, sharp lance-head type of tool with a pointed tip and vertically flat triangular butt-end base to which the limy concretion is still sticking. The upper face is worked while the under face is flat, smooth, with no flaking at all and is patinated brown. There is an irregular centrally running ridge on the upper face which starts from the apex of the triangular base and ends at the tip. The sides are steep, making  $45^\circ$  with the ridge and from sharp edges with the ventral plane converging at the tip. Near the tip, on the left side of the ridge is a deep flake scar which covers the upper  $1/3$ rd of the side. Loc.: Found *in situ* in upper sands of River Sher, Devakachhar. Measurements:  $147 \times 86 \times 42$  mm.
- c. An unrolled fresh, Acheulian hand-axe made on fine-grained red quartzite. The lower-half of the specimen is pebbly and retains the original cortex of the rock. The upper half has been thinned from both the dorsal and ventral side by characteristic Acheulian method of wood-hammer technique. The shape is almond with tongue-like, short and straight apex. The butt end is narrow, thick and unworked. The working end is limited to the upper half of the tool and is remarkably sharp and wavy. The upper face has a hump in the middle and the flaking begins from it upwards. The underside is covered

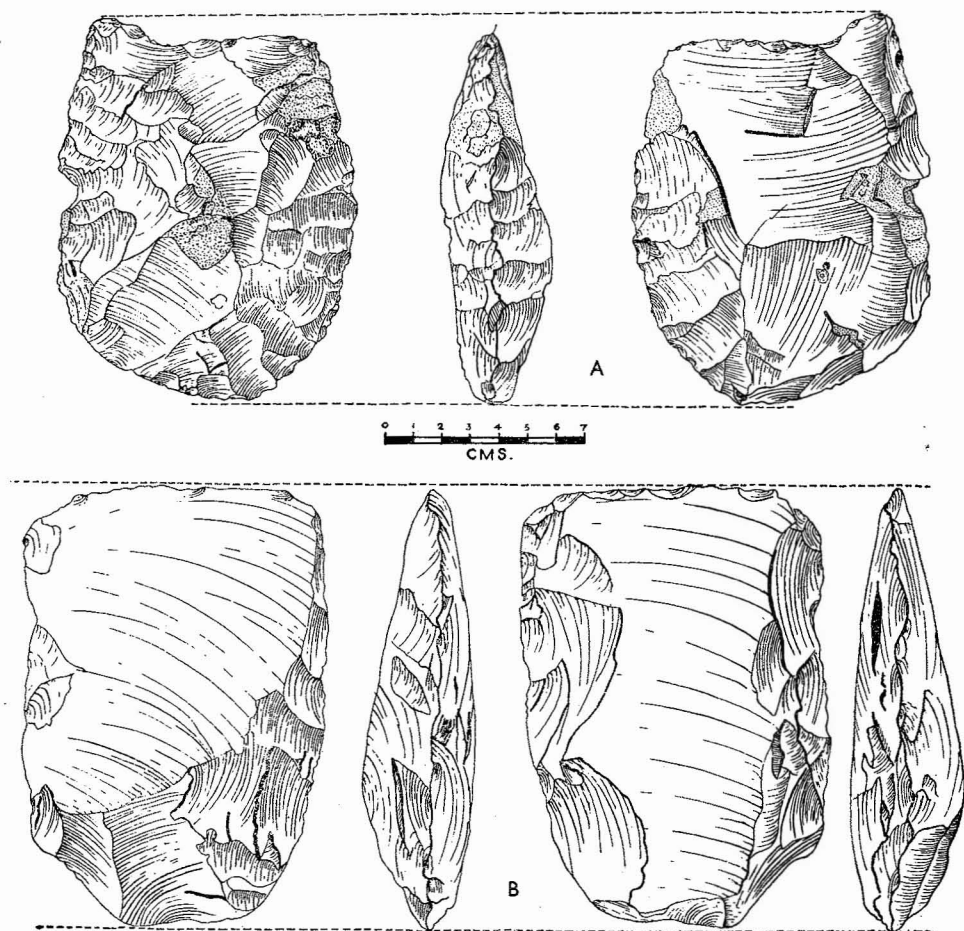


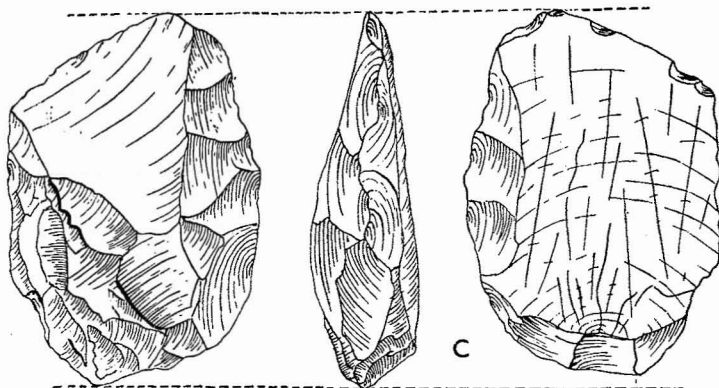
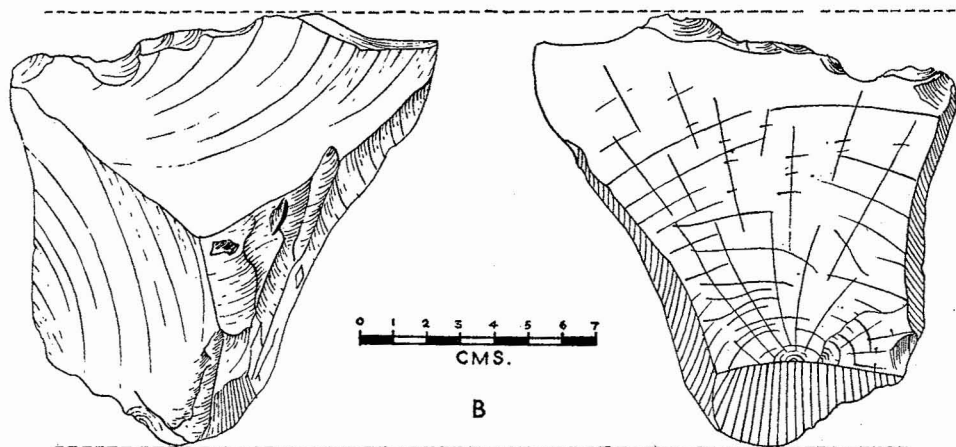
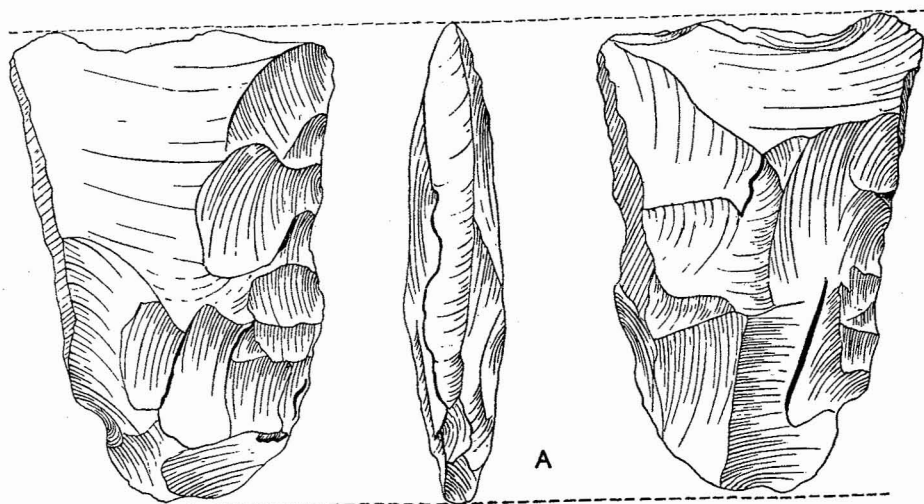
FIG. 4. NARMADA ARTIFACTS

- a. A fresh, unrolled, beautiful Acheulian U-shaped cleaver made on honey-coloured jasper. It has a round butt-end and a nearly straight working edge except on the right where there is a concavity. This is a specimen where controlled shallow flaking by wood-hammer technique can be convincingly demonstrated on both the surfaces. The only flaw in the otherwise exceptionally beautiful specimen is the presence of many patches of original cortex on both the sides. Loc.: Found *in situ* in the upper sands of River Sher, Devakachhar. Measurements:  $126 \times 101 \times 35$  mm.
- b. A good specimen of U-shaped-cleaver on medium-grained red quartzite; semi-rolled. Butt-end irregular and roughly semi-circular; the working edge straight and is a result of intersecting of two big flake scars, one from each surface. The upper face worked along the lateral sides, by 'step' technique. The under face is covered by a large flake which meets its counterpart from the other side to make the edge. The right-half of the butt-side is further chipped and there occur many 'steps'. Loc.: Budhni gravels, Hoshangabad. Measurements:  $152 \times 102 \times 37$  mm.

by flaking all over except the right and left sides, of the lower half which still retains the original cortex. Loc.: mouth of the River Barurewa, Devakachhar. Measurements:  $159 \times 84 \times 56$  mm.

## FIG. 5. NARMADA CLEAVERS

- a.* V-shaped, on dark red, coarse-grained quartzite. Quite rolled. Butt-end round and narrow; working edge broad and relatively straight and is made by big flake scar coming from the underside and meets the rim of the upper face. Loc.: Bhagwara gravels, Hoshangabad. Measurements:  $133 \times 94 \times 28$  mm.
- b.* V-shape, with oblique transverse working edge and narrow, pointed butt-end. The upper face exhibits three-layer flake scars, the anterior one meeting its counterpart from the underside to form the edge. The underside presents a clean surface with a prominent bulb of percussion at the top of which is a striking platform. Material: light brown quartzite. Semi-rolled. Loc.: Budhni gravels, Hoshangabad. Measurements:  $125 \times 119 \times 38$  mm.
- c.* A beautiful U-shaped specimen with oblique edge made on light brown, medium grained quartzite. The upper face of the cleaver is worked all over except the area adjoining the working edge which is formed by a single flake scar joining the under surface to form a sharp edge. The under face is 'clean', with positive bulb of percussion and prepared striking platform. Slightly rolled. Loc.: Ramnagar. R. Narmada. Measurements:  $99 \times 74 \times 31$  mm.



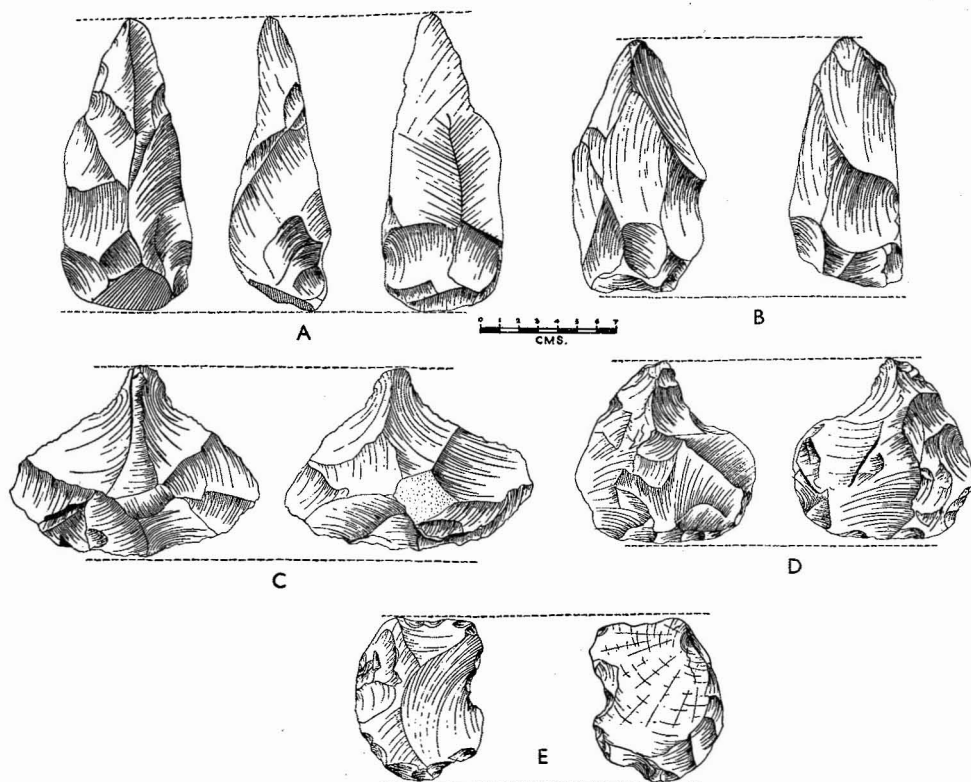


FIG. 6. NARMADA ARTIFACTS

- a. Of tetrahedral shape with long pointed apex made on light brown quartzite. The butt-end consists of an unworked smooth platform. The apex is long and pointed. The working edge wavy and allround. The upper face has a ridge which starts from a hump at the butt-end and tapers down to the tip. The sides are steep and worked. The under surface is worked but rolling process has dimmed the flake scars. Loc.: Bhagwara gravels, Hoshangabad. Measurements:  $145 \times 66 \times 57$  mm.
- b. A specimen with polyhedral, prismatic structure on a triangular base, made on light brown quartzite. The butt-end has a base made of an almost round flake. The apex is short and blunt. The upper face has a wavy ridge going from the butt to the tip. The flakes are deep and broad. The under face is clean and smooth. Semi-rolled. Loc.: Budhni gravels R. Narmada. Hoshangabad. Measurements:  $125 \times 64 \times 61$  mm.
- c. A triangular specimen with semi-circular bottom and short, pointed tip. The material is medium-grained red quartzite and is unrolled. The tool is worked on both the sides and has a sharp edge allround. The upper face has a hump in the centre and the flaking is centrepetal. The underside has also a hump in the centre and seven flakes can be counted which have been removed centrepetally. The top of the hump is left with a patch of original cortex. There are limy encrustations on the right side of the upper face. Loc.: Found *in situ* in upper sand being eroded, on the left of the road coming from Devakachhar village. R. Sher, Narsinghpur district. Measurements:  $126 \times 94 \times 48$  mm.
- d. A chordate-shaped artifact, nicely made, specimen with a beaked tip, worked on both the sides by controlled flaking; 'steps' present. The edge allround. Material: fine-grained quartzite. Loc.: Budhni gravels. Measurements:  $86 \times 92 \times 30$  mm.

At Hasalpur, Hoshangabad, and Mahadeo Piparia a very primitive industry was located. It is similar to the earliest phase of the Chellian stage of the hand-axe tradition. In Africa this stage belongs to the Lower Middle Pleistocene, i.e. to the end of the Kamasian Pluvial. It is mainly a pebble industry with huge, heavy, crude tools similar to those found in the basal layers of the 2nd bed at Olduvai Gorge in East Africa.

The next bed to yield tools is the 2nd cemented gravel. Tools were chiseled out *in situ* at Devakachhar, Ratikarar, Saguan Ghat and Barman Ghat. Typologically they belong to the Late Abbevillian to Early Acheulian stage.

The sandy layers deposited in cross-current above this cemented gravel yields advanced Acheulian-like tools showing controlled flaking by cylinder hammer technique. The material of these Acheulian-like hand-axes includes some finer stone material like chalcedony, jasper and surprisingly flint also.

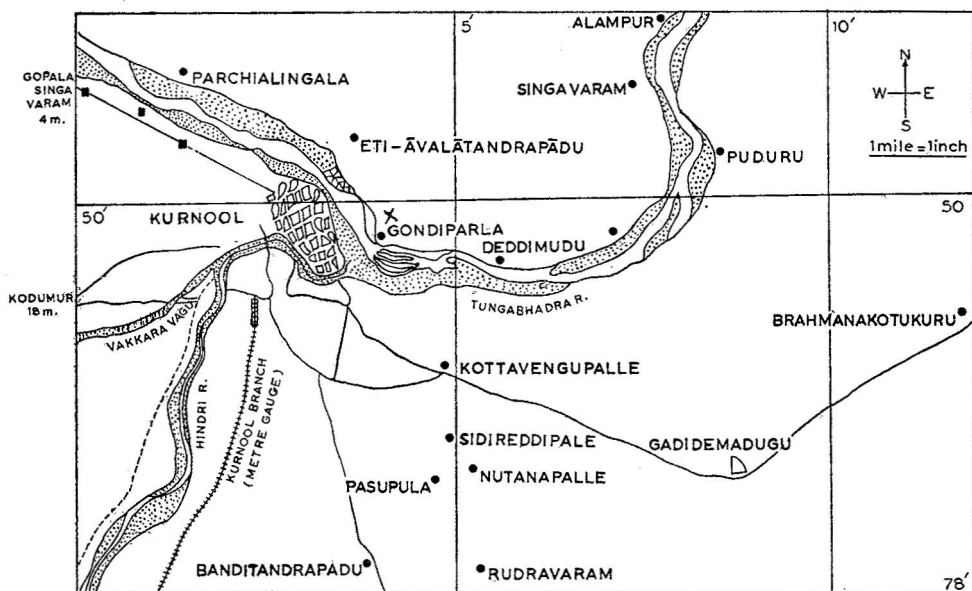
Along with these fine hand-axes, we find a scraper cum point industry on jasper and chalcedony known generally as Series II. The fossils found associated with these suggest that these industries flourished in Late Pleistocene times. The Series II industry might have continued to flourish in the Holocene and might have given rise to the microlithic industries. These Series II tools were found *in situ* at Devakachhar and Barman Ghat. The occurrence of typologically late Acheulian tools and Series II together in the same layers indicate that they were contemporary. The prehistoric folk manufacturing Series II tools influenced the people making Acheulian-like tools in the choice of better stone material while the latter would taught the former their refined flaking technique.

#### THE KURNOOL CAVES

The exploration work in this area was carried out in the months of January and February 1962. Work began at Kurnool town in Andhra Pradesh with the famous bone caves of Billasurgam and other groups in its vicinity. Besides visiting six old groups of caves, Billasurgam, Krishnamakona, Sanyasulgavi, Gurlagutta and Yaganti, the writer discovered three other caves in a gorge, thickly forested in the Neelakoya valley. In these large size caves, situated more than 15 feet above the ground level, were found undisturbed floor debris. Near Bugga temple on the Kurnool-Betamcherla road, one rock shelter with paintings in red ochre was discovered with chalcedony microliths (fluted cores, scrapers, points and flakes) in its vicinity.

A megalithic site was also discovered on the northern bank of the Tungabhadra behind the medieval fortress, opposite the town of Kurnool (Map 4). The site was on a mound, now a ploughed field, with a scatter of pottery and neoliths all around. Near this megalithic site, there are some high grounds, on which a large number of Series II tools made on jasper were obtained.

- 
- e. A hollow-sided scraper on light brown fine-grained quartzite. The under face exhibits a big flake removed in a manner reminiscent of the Levalloise technique. The hollow scraping side seems to have been used as shown by battering marks. Semi-rolled. Loc.: Bhagwara gravels Hoshangabad. Measurements:  $79 \times 65 \times 21$  mm.



MAP 4. River Tungabhadra at Kurnool, Andhra Pradesh. The mark X opposite Kurnool town represents the megalithic site discovered during the present exploration.

### *Previous Research*

The Billasurgam caves were first reported to the scientific world in the 1840's by Captain Newbold, F.R.S. who found them to be ossiferous and made a small collection which was never described and was subsequently lost. For sixty years nothing was done till Prof. Huxley asked Sir M. E. Grant Duff, then Governor of Madras Presidency, to have it explored. As a result Robert Bruce Foote, the Superintendent of the Geological Survey of India, was instructed to explore and excavate the caves to procure the material afresh.

In 1884, Bruce Foote and his son Lt. H. B. Foote revisited the caves. While Bruce Foote was busy on other matters his son conducted the excavation and procured a large collection of fossils. These were sent to Calcutta to be described by Lydekker in *Palaeontologia Indica* (1886), and were found to belong to the Pleistocene. Besides fossils, H. B. Foote obtained a number of artifacts which to his father seemed to be Magdalenian in type. This Magdalenian type of material included a pendant made of bone. This material also was lost.

### *Present Exploration*

L. A. Cammiade, at one time the Collector of the Kurnool district, visited these caves and in a paper published in 1927, he said that Foote's failure in not finding the fire-hearth and prehistoric tools in the caves was because the excavations were made inside instead of at the entrance.

His contention was that present-day entrances were in prehistoric times dark and humid places not worthy of human habitation and that the high-walled passages



leading to the present-day chambers were well lighted, spacious and fit for living. And if these canyon-like passages are explored and cleaned of roof-debris, there is a possibility of finding ashy floors and prehistoric cultural material and the much sought bones of fossil man himself. In view of this, the caves were thoroughly explored by us thirty years after Cammiade's search. Cammiade may be right but his suggestions are workable only, when the roofless hall in front has been cleared of hundred of tons of debris fallen from the roof and the jungle cleared.

### *Caves Examined*

The following groups of caves were examined, the numbers associated indicating the number of caves and chambers in each group.

i.	Billasurgam Caves	7
ii.	Sanyasulgavi Caves	4
iii.	Krishnamakona Cave	1
iv.	Yaganti Caves	5
v.	Gurlagutta Caves	1
		<hr/>
		18
		<hr/>

Besides the above, five unrecorded caves and two rock shelters were discovered. These are:

- i. Three caves and one rock shelter in a gorge near the Bezwara-Guntkal railway line near Paniyam;
- ii. Two caves known as Tamarind Caves in Neelakoya Valley;
- iii. One rock shelter with paintings at Bugga.

### *Areas Explored*

New areas were explored to find new caves with virgin floors. The following is the list of the areas explored:

- |      |   |       |  |
|------|---|-------|--|
| i.   | Rocky area which falls on the Kurnool-Nandyal Road at 12th mile stone from Kurnool; | vi.   | Paniyam lime stone hill;                           |
| ii.  | the high ground on the other side of Tungabhadra opposite Kurnool town;             | vii.  | the deep gorge between Gurlagutta and Betamcherla; |
| iii. | Nandyal area;   | viii. | Yaganti hills and Mola-Ka Pahar in Bugganpalli;    |
| iv.  | Betamcherla range;  | ix.   | Bellary regions; and                               |
| v.   | Bugga temple area;  | x.    | Giddalur—Markapur area in Nallamalai.              |

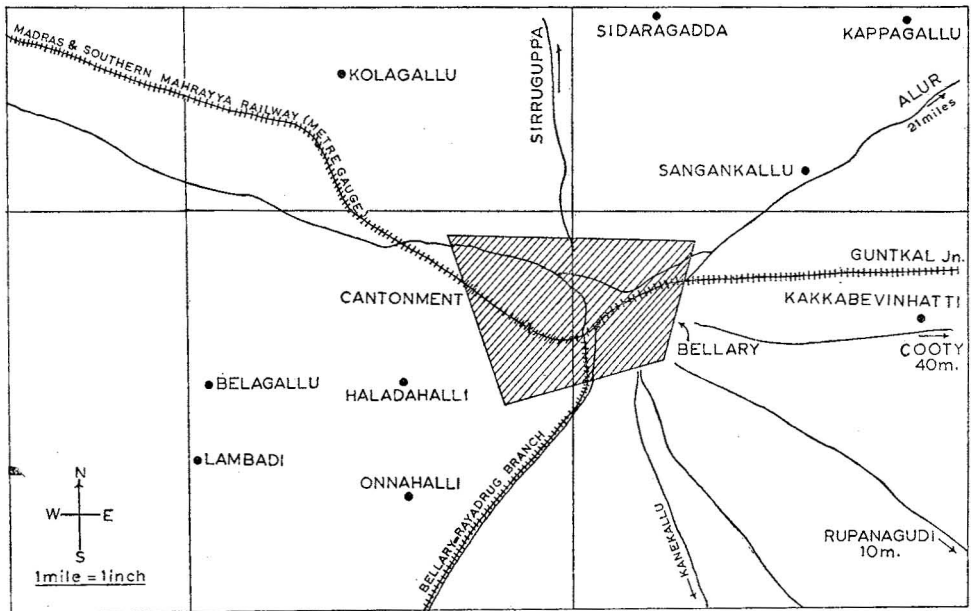
### *Material Collected*

No finds were made around the caves; the many flakes which we saw appeared to me the work of present-day stone cutters. Bruce Foote found a very much



rolled specimen like a hand-axe. The specimen, which I examined in the Madras Museum, is far too rolled and is not to be attributed to human agency.

Neoliths were collected from the top of the Sannarasamma hill near Sangankallu about three miles northeast of Bellary town (Map 5). In the collection were a few new types of neolithic cells and axe-like cores bearing a superficial resemblance to the Acheulian hand-axes. The importance of this discovery lies in that such cores were found at Sukkar and Rohri flint factory sites in Sind, the blade industry of which is regarded as pre-chalæolithic.



MAP 5. Town of Bellary and village of Sangankallu, a neolithic habitational cum manufacturing site, in Mysore state.

#### SURVEY OF THE SAGILERU VALLEY, GIDDALUR, KURNOOL DISTRICT

Gundlakama-Markapur area is one of the earliest where stone tools were collected and commented upon (Cammiade and Burkitt 1930). The writer became interested in the terrain and particularly the Sagileru valley after going through Soundara Rajan's article (1952) wherein, he discussed the Stone Age industries and a few sections he thought to belong to the Pleistocene. He discussed two sites, Giddalur I and Giddalur II, which are within 200 metres of one another on the river Sagileru, and said that one contained a Levallois element while the other did not.

After examining the Sagileru banks and the deposits, I found that the section—the photograph of which Soundara Rajan included in his article (1952)—was of very recent origin without relation to any Pleistocene sequence. Such sections are to be found in the river after any flood season.

A large number of tools were collected from the two particular spots mentioned by Soundara Rajan so that the industry may be studied in detail. In my collection

there are many flakes similar to those illustrated by Soundara Rajan which have faceted platforms. But, a faceted platform does not make a flake Levallois when it possesses also very obtuse angles. The study of African prehistory, particularly of South Africa, shows that the prepared platform technique was developed independently by hand-axe manufacturing folk long before the Levallois element reached there. Mr Soundara Rajan compared the tools with South Africa but missed the point and drew wrong conclusions from a small collection.

Three terraces were noted on the river Sagileru, the topmost being the earliest. These terraces can provisionally be named as T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub>. On T<sub>1</sub> was found a factory site with a large number of fresh tools. On T<sub>3</sub>, which is formed by the present bed of the river, tools obtained were rolled and are possibly derived from T<sub>1</sub> where Stone Age man lived and manufactured his tools and weapons.

The microlithic industry on quartz described by Soundara Rajan from that area was also not confirmed by my exploration. On the river Sagileru very near the hill on which a temple is situated, quartz veins occur in abundance and in the fields and around the hill area the small pieces of quartz lie scattered about. Those small pieces have been taken by Soundara Rajan as microliths. After examining the collection of more than one thousand pieces with a magnifying glass I came to the conclusion that they are natural. A similar case was noticed at Sangankallu where Subbarao (1948) described a quartz microlithic industry. There also quartz veins are in abundance and because of its brittle nature the whole area around the hills is full of such pieces. The writer found microliths on chalcedony and chert but on brittle quartz, he found none. Any retouching apparent on the quartz pieces should be taken with reserve because of the brittle nature of the material. In the present circumstances I do not regard the quartz microliths from Giddalur and Sangankallu, the places of which I have first hand knowledge, as genuine.

From the Narmada evidence, and taking into account the typology and technique, one could date the Palæolithic industry of Sagileru in between the late Middle Pleistocene and Upper Pleistocene.

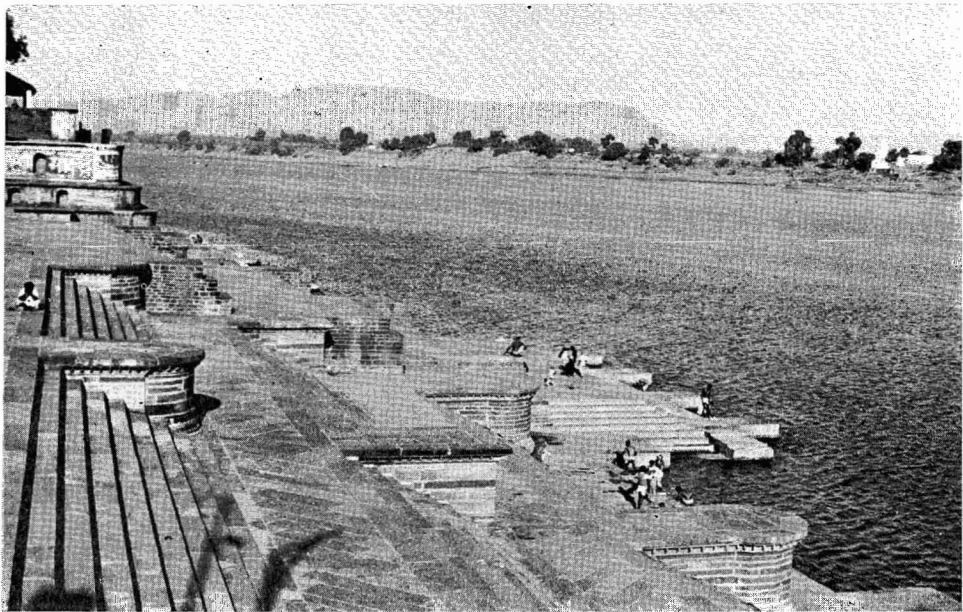
#### ACKNOWLEDGEMENTS

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*a.* River Narmada at Hoshangabad, in the background the Vindhya mountains.



*b.* The Laterite section at Chidgaon. Note the thick, black stratum of laterite at the top.



*a.* Sher Nadi at Devakachhar in Narsinghpur district, Madhya Pradesh. Note the eroded section on both the sides of the passage coming from the village. Many vertebrate fossils were collected from this place.

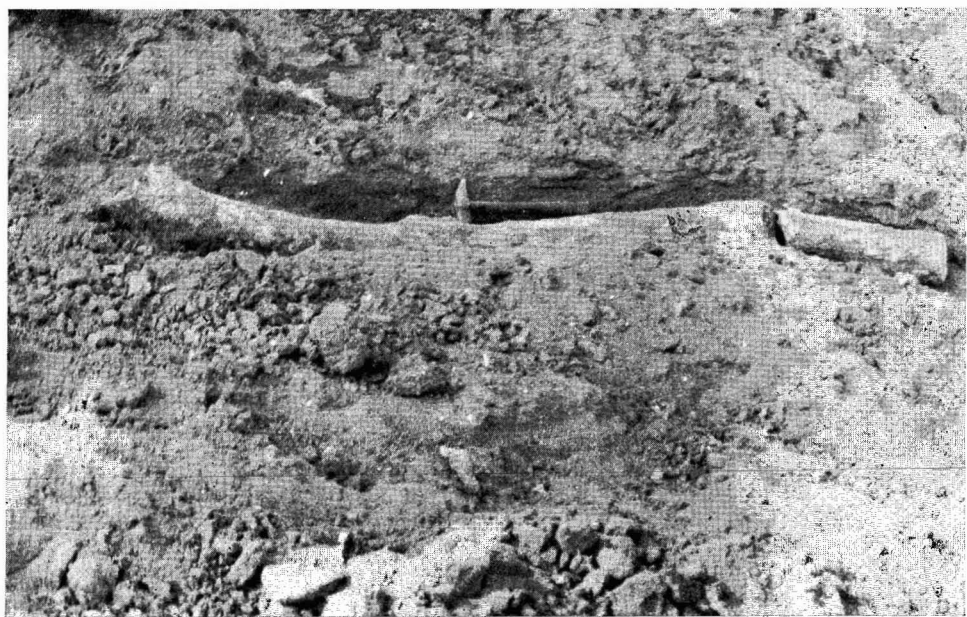


*b.* Umarghat on the Umar Nadi, near Devakachhar. A rich fossil cum tools yielding locality.

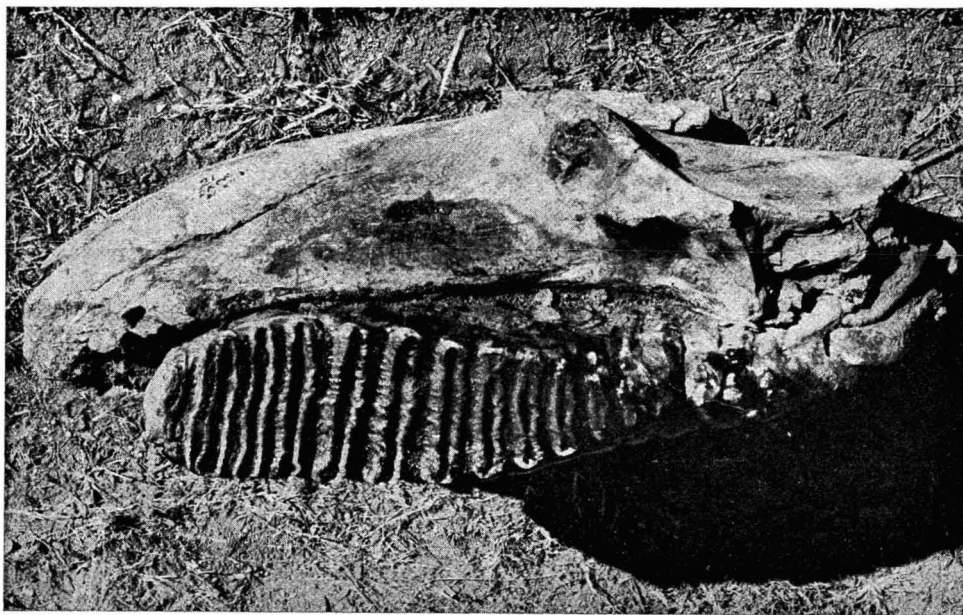




a. An early Stone Age factory site around a green quartzite outcrop on the Narmada near Barman ghat in Narsinghpur district. A rich assemblage of tools were obtained from here.



b. An elephas tusk found *in situ* near Kharra ghat on the Narmada at Hoshangabad. It measures 2·14 metres (7·05 ft.) in length along the outer curve and is 51 cm. (2·00 in.) maximum circumference near the root-end.



a. A molar of *Elephas namadicus* found at Devakachhar in the eroded sand of upper sandy layers.



b. Hippopotamus molars found in the eroded sand of upper sandy layers at Devakachhar.